

Gasohol fuels Paducah fleet

The Paducah Plant recently marked a month of successful operation of a comprehensive program to use gasohol for fueling the plant's total automotive fleet, with the exception of small engines and larger diesel-fueled equipment.

Bill Halicks, program coordinator, said the program has encountered no problems since its implementation in February.

A six-month experimental test was conducted on two cars, two pick-up trucks and a forklift prior to implementation of the program. The study showed a three percent increase in mileage, with no adverse effect to the engines or automotive parts. No engine or carburetor modifications were required with the 10 percent alcohol-90 percent gasoline blend, although Halicks noted that higher percentage mixtures do require certain adjustments to prevent engine problems.

Since 1978, the plant's gasoline allocation has dropped by 25 percent. Although the use of gasohol may produce a slight increase in efficiency, the primary purpose of the program is to reduce gasoline consumption.

There is a cost increase of about seven cents per gallon with gasohol, since pure grain 200-proof alcohol is slightly more expensive than gasoline.

Laboratory tests on the gasohol mixing procedure showed that without initial agitation, the alcohol component would settle to the bottom. As a result, when the actual mixing was done for plant use, the alcohol was recirculated through the dispensing pumps. A subsequent

(Please see page 8)

Corporate world of Union Carbide

THE MOST SPECTACULAR, far reaching product introduction in the company's history began March 2, when Union Carbide introduced its "ENERGIZER—Energy Source of the '80's" campaign on all three of the nation's television networks. The television campaign is only one phase of the all-out advertising campaign in behalf of the Eveready "ENERGIZER." The network campaign will be augmented by spot TV in many markets. In March and April, full-page, four-color ads will appear in *Newsweek*, *People*, *Sports Illustrated*, *Sporting News*, *Woman's Day*, *Good Housekeeping*, *Ms.*, *Field and Stream*, *Sport*, *Popular Mechanics*, *Sports Afield* and *Reader's Digest*. In April, *Parade* and other independent Sunday newspaper supplements will carry a full-page, four-color ad offering consumers a 15¢ store coupon good on any "ENERGIZER" battery and announcing the "Match & Win" sweepstakes featuring 1980 prizes.

More Alpine climbing
Page 4,5



UNION
CARBIDE

Nuclear Division News

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New transportation plan goal of UT transit study

Those employees with an aversion to filling out forms were probably less than overjoyed to see yet another one added to the list earlier this month, when the new Vehicle Usage Log sheets were distributed to the Oak Ridge sites. But the new forms—which are only temporary—aren't just more paperwork; they have a definite purpose.

The log sheets are part of a "needs assessment" study being conducted in the Nuclear Division by the University of Tennessee Transportation Center in an attempt to develop a transportation program that will meet the needs of all employees. This marks the first time all employees have filled out an identical log sheet, so that all data can be taken on the same basis.

The new sheets, designed by UT personnel, are detailed enough to provide all of the information necessary to understanding employees' transportation needs. Each question asked on the log sheet is asked for a reason: for instance, odometer readings are requested in order to provide a check on whether all trips have been recorded.

When enough data have been gathered to form a reliable picture of our driving patterns—probably within a month or two—these very detailed forms will be discontinued.

The UT study is an outgrowth of work begun by an 11-member, three-

plant committee set up last October to assess the transportation needs of employees at the Oak Ridge sites and to develop an in-plant and interplant transportation plan that would be workable for everyone.

The committee, called the User and Evaluation (U&E) Committee and headed by Don Walukas of ORNL, had in hand several internal transportation surveys done earlier. However, they felt that the data used in these surveys—taken mostly from the old log sheets—were not complete enough to give an accurate picture of where, when and why employees travel, and that an outside perspective was needed. They requested UT's services late last year to conduct research on the Nuclear Division's transportation and vehicle utilization.

After looking at the available data, the UT Transportation Center staff agreed that more research would be necessary in order to do an accurate study, and initiated the forms we're now using.

Seek employee input

To supplement the data being collected by UT, the U&E Committee is seeking input from employees on ways the Nuclear Division can reduce gasoline usage. (The Division's gasoline allocation for calendar year 1980 is 775,000 gallons, nearly 30 percent less than our allocation two years ago.)

Serving with Walukas on the committee are Dave Ghormley, representing Computer Sciences Division; John Gray, Operations Analysis Division; John Harding, Engineering Division; Bob MacPherson, ORNL divisions; Lowell L. McCauley, Operating Contractors Project Office; John Shoemaker Jr., ORGDP Operations; Irv Speas, Nuclear Division Employee Relations; Jim White, Technical Division; Jack Yaggi, Y-12 Operations, and Jim Walsh, General Staff (Accounting, Auditing and Purchasing Divisions). Employee suggestions should be directed to one of these representatives.

Both the U&E Committee and an Implementation Committee, chaired by Dan Stroud of Y-12, are part of a Three-Plant Transportation Steering Committee headed by L. A. (Tony) Dean, ORGDP.

Interim system

When all of the data have been analyzed and employee suggestions have been heard, our entire transportation system will be restructured in some fashion. In the meantime, an interim system of increased interplant shuttle and in-plant bus and taxi service has been initiated.

A new shuttle is operating between ORGDP and ORNL, two additional runs have been added to the ORGDP/Y-12 shuttle and some extra pickup points have been added to existing shuttle schedules. Also,

(Please see page 8)

'Cell Rats' contribute page to Paducah history



'RAT' SOLO—Welding is an important part of the cell change procedure. Tony Newsome performs the skill on part of the massive equipment that is housed in each process cell.



'RAT' PACK—Members of the cell change crew often meet with an engineering representative to discuss problems and exchange information. Working here, from left, are Ronnie Reid, Kent Bowman, Kerry Peck and Willie Sykes. Seated are draftsman Larry Heavrin and crew foreman Robert Fuller.



'RAT' PROOF—Taking account of their presence are some of the original 'Cell Rat' crew. From left are Randy Fondaw, Mike Moss, Tony Newsome, David Alexander, Ronnie Reid and Donald Childers.

The Paducah Plant has a complex of four massive buildings housing thousands of tons of equipment, controls and motors. It is here the primary mission of the plant takes place—enriching uranium hexafluoride.

Until about 10 years ago, the interiors of the four buildings changed little. Around 1970, the rows of uniform process units began to burst at the seams and the pattern made by long stretches of aisles was disrupted by the remnants of a technology that had matured.

The forces behind this overhaul, which is now nearing completion, were workers from varied backgrounds and experience. Together, they formed a team who would ultimately disassemble and reinstall every piece of equipment contained in these shells and, in the process, introduce a new era of gaseous diffusion production.

In completing this task, various crews and work groups came together. Paducah's "Cell Rats" are a product of that environment.

As the story goes, the original 12 members of the maintenance crew became somewhat infamous by finding themselves on the receiving end of periodic accusations concerning misplaced tools, etc. When the crew realized they were shouldering this new-found responsibility, they good-naturedly took the name of "Cell Rats."

Since that time, the "Rats" have multiplied to almost 10 times their original number. Little yellow

stickers can be found on scores of hard hats in almost every building. It seems the logo has been used by dozens of cell changeout crews as a badge of fairly accurate description.

"If you look at us from overhead," said Randy "Fonz" Fondaw, charter member of the crew, "we kind of look like rats running in and out and all around the cell units."

In reality, it happens in just that way. Working in coordination with other departments, the crew dismantles a cell from the outside in. Walls, ceilings, pipes, converters, compressors and all other related hardware are removed for improvement by other craftsmen. "Cell Rats" can be found cutting, welding, operating cranes or removing equipment in sometimes immoderate heat or confined spaces.

Then, upon completion of the improvement phase, the crew prepares for the installation of the newly refurbished components back to their original state of operation.

It's a massive operation in which the "Cell Rats" take a certain amount of pride. "We enjoy the work we do," said Mike Moss. "It's never exactly the same and we're cross-trained so that we can work in different areas."

Despite the eventual completion of the program, the friendships and day-to-day relationships, which have been created by the two-man teamwork the crew employs, will always serve as a reminder of this particular piece of the plant's history; and the "Cell Rats" contribute another colorful page to the plant's heritage.



'RAT' DUO—Bobby Gifford, left, and Kerry Peck work together in the removal of cell equipment. The crew always works in two-man teams and utilizes cross-training to achieve greater efficiency.

Question Box

Taxes at retirement

QUESTION: Employees who are retiring want to minimize taxes to be paid on retirement. Unfortunately, the layoff allowance, pay-in-lieu-of vacation, savings bond purchases, and the savings plan account all become available at the time of retirement, resulting in high income and high income tax that year. UCC has softened the problem by allowing the Savings Plan Personal Investment Account payout to be postponed for a year or to be paid over several years. Why is it not possible to spread the layoff allowance (which was earned over many years) over several years instead of having this sometimes large sum taxed in only one year?

ANSWER: Some tax savings are possible as indicated below:

Vacation payments must be made at the time of retirement. Since an employee who last works on December 31 actually retires on January 1, this payment is made in the latter year.

Layoff allowance is also paid at the time of retirement. This can be deferred, however, to the year following the year of retirement if the employee signs an irrevocable request that this be done.

U.S. Savings Bonds purchased through payroll deductions are merely turned over to the employee

at retirement and are normally not taxable until cashed.

Deferral of the Personal Savings Account (to which you referred in your question) is not as advantageous as in the past. The IRS code now provides for special treatment on "Lump Sum Distributions" from qualified savings plans such as ours. Since the tax on such a "lump sum distribution" is independent of other income, deferring the settlement to minimize taxes is normally not necessary.

This whole matter is complicated. You should discuss it in general terms with your Benefit Plans Administrator and in all probability should consult an income tax specialist.

Favored parking places

QUESTION: What happened to the idea, mentioned a few years ago, to set aside the most coveted parking spaces at ORNL for car pools? Does ORNL have any present plans for encouraging conservation in driving to and from work?

ANSWER: Management very definitely encourages car pooling and van pooling. Consideration has been and is currently being given to privileged parking for car pools, but no manageable scheme for monitoring this has been devised yet. ORNL does have reserved spaces for vans registered with the Ride Sharing Coordinator. The Nuclear

Division is revitalizing its ride sharing promotion by establishing up-to-date data banks of employees interested in ride sharing, by promotional posters, and by publicity articles. While the Company cannot govern how employees get to and from work, it does encourage ride sharing in car pools and van pools and is and will take reasonable steps to maximize results.

Compensatory time

QUESTION: What are the Nuclear Division's policies on personal time off without pay for salaried employees? And compensatory time for overtime worked by exempt employees? Are these policies uniform or do they vary from division to division?

ANSWER: Personal time off with pay is provided salaried employees to permit them to attend to matters that cannot reasonably be done outside working hours and, in most instances, cannot be anticipated too far in advance. Such absences should normally result from a need and not be merely a convenience.

Compensatory time off may be granted to exempt salaried employees who have been assigned to work **excessive** overtime to accomplish the job to be done. Compensatory time off should be granted, usually not on a direct offset basis, at a time mutually agreeable to the employee and his/her supervisor

If you have questions on company policy, write the Editor, **Nuclear Division News** (or telephone your question in, either to the editor, or to your plant contact). Space limitations may require some editing, but pertinent subject matter will not be omitted. Your name will not be used, and you will be given a personal answer if you so desire.

as soon as practical after the excessive overtime has been worked.

The above policies are uniform throughout the Nuclear Division and should be applied in a consistent manner. Human judgment being what it is, however, application may vary somewhat. If you have a specific question, it should be addressed to your supervisor and/or the installation Employee Relations Manager.

Non-smoker's rights

QUESTION: What rights does a non-smoking employee have who works in the close proximity of a chainsmoker? I do not want to hurt his feelings, yet I feel that something should be done.

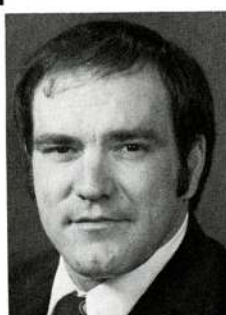
ANSWER: Your first right is to tell the individual that the smoke bothers you, if in fact that is the case. If this doesn't bring relief, discuss the matter with your supervisor, who may be able to help resolve the problem.

While Company policy normally prohibits smoking only in areas in which a fire hazard exists, we certainly encourage dialogue between employees where one's actions are causing discomfort to others.

Many employees have effectively dealt with this problem in their own offices by displaying "No Smoking Please" signs and by removing all ash trays.



Douglass



McDonald

About People

Two Nuclear Division engineers were honored recently by the Oak Ridge Chapter of the Tennessee Society of Professional Engineers. **Thomas E. Douglass**, manager of Mechanical Design Engineering, was given the 1979 award, the society's highest honor. The award is given to the professional engineer whose contributions to the profession have been outstanding. It is based on service to the profession, personal professionalism, civic responsibility, outstanding technical accomplishment, character and service to the public.

Douglas joined Union Carbide in 1958 and has been active in professional and civic endeavors, serving as president of the Tennessee Society of Professional Engineers in 1976. He helped arrange the annual National Society of Professional Engineers' meeting in Knoxville last year. He is a member of the Society of Manufacturing Engineers, the American Society of Mechanical Engineers and the American Society of Engineering Education.

Also named in Engineering Week honors was **Larry A. McDonald**, section supervisor in the Engineering Division, selected as young engineer of the year. Bases for selection for this honor are the individual's scholastic achievements, professional and technical society activities, civic involvement and engineering achievements. McDonald joined Union Carbide in 1967 and is currently involved in technical management of electronics section that provides design engineering services for projects in both Y-12 and ORGDP.

He has been active in the Instrument Society of America and the WATtec conference and exhibit. He was a senior executive counselor in ISA in 1978 and has served on various arrangements committees for WATtec and has been a member of the management awareness committee and the technical program committee.

Denton, Grubb receive Y-12 promotions



Denton



Grubb

Two promotions have been announced at the Y-12 Plant. Timothy J. Denton has been named a radiographer in Product Certification and James P. Grubb a process foreman in the Metal Preparation Division.

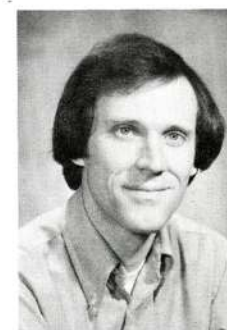
Denton, a native of Knoxville, attended the University of Tennessee. He worked in sales before joining Union Carbide in 1978. He and his wife, the former Ruth Ann Wampler, live at 313 East 1st Avenue, Lenoir City.

Grubb, a native of Big Spring, Tenn., joined Union Carbide in 1953 after serving in the U. S. Army. His wife is the former Joyce Ann Falin, and the couple lives at 111 Lenigh Lane, Oak Ridge. They have four children, Scott, Tobye, Rarry and Teresa.

Next issue. . .

The next issue will be dated April 3. The deadline is March 26.

Adams promoted at Paducah



Adams

J. Keith Adams has been promoted to construction engineer in the Paducah Plant's Plant Engineering Division. Adams joined the plant in February, 1977, and worked as a technical associate and inspector. Prior to joining the Paducah Plant, he was employed by Cornman Plumbing and Heating Co.

Adams has a bachelor's degree from Murray State University and is a member of the American Society for Non-Destructive Testing. He and his wife, Sherry, live on Friedman Lane in Paducah.

Joys & perils of mountaineering

In my last article on mountaineering, I mentioned some things that might help to distinguish this activity from the closely related sport of hiking. You may justifiably ask, "Well, why climb anyway—why not just hike up the mountains?" Hiking is O.K.—in fact, you can hike up many mountains—that is, if you don't go too high or pick the wrong season. However, most mountain ranges with altitudes above 10,000 feet have snowfields that last through the summer. So, even in summer, you will encounter snow and glaciers on the higher peaks. The snow and ice undergo changes due to varying conditions and produce formations that don't allow good hiking—they're lumpy. Another fundamental point to keep in mind is that we left the trees and bushes somewhere below, so there isn't much to hold on to when you start sliding down the hill. The other point to hinder hiking is that some of the mountains are very steep. Thus, we are back to climbing, which, to the mountaineering world, means ropes, ice axes and crampons.

*

Surprisingly, the rope is not used as a climbing aid. It is almost entirely a safety device to protect the climber from a disastrous fall. A conventional climbing rope would be about 7/16" in diameter, 150 feet long and would cost \$100 or more. It is a rope within a protective covering, and its most important characteristics are strength and the ability to absorb shock. In addition, the rope needs to be lightweight and resistant to abrasion, knotting and kinking. It should hold knots well, provide a good grip and soak up little water. A normal life expectancy might be two or three years but would depend upon the treatment and number of falls that the rope had undergone. The climber treats the rope as a sacred object—and rightly so; life often depends on it. Careful handling to avoid unnecessary abrasive wear is important. One does not step on a climbing rope.

In actual use, a lead climber proceeds up a section of the climb (called a "pitch") with the rope attached. He or she is climbing alone and places anchor points ("protection") in the climbing face along the way. The other end of the rope is in the hands of a very important partner, a "belayer," who feeds the rope out as the lead climber moves. In this manner, the lead climber can fall a distance equal to the rope length past the last point of protection, plus the slippage allowed by the belayer in bringing the rope movement to a halt, plus the rope's elasticity factor. The slippage factor and the shock absorbency (elasticity) of the rope are necessary to prevent the lead climber from coming to an abrupt, jerking halt.

Communication is important

Climbers fully realize the importance of clear communication and use a very limited and precise vocabulary to relay messages. If a climber is falling, he or she definitely wants the belayer to realize this fact and act promptly. Climbing teaches one a safety discipline in a very personal manner—sort of like electricians, you just don't find many careless ones around these days.

Another axiom of mountaineering is that it takes an ice axe to turn a hiker into a climber. An ice axe is

sometimes used for chopping steps in hard ice on steep grades. Primarily, however, the ice axe is a necessary safety precaution. With it you can keep from sliding down a snow or ice slope if you should lose your footing. The technique is called "self arrest" and involves sinking the pick end of the axe into the snow or ice with your body weight lying on top of the axe handle—sort of like an anchor. You can also use the ice axe as a belay pivot and as a walking stick to help keep your balance when traversing on steep slopes. In addition, it can be used as a brake when you are glissading down a snow slope.

"Glissading" is supposed to be sort of a controlled slide down a steep slope while you are leaning on your ice axe in a sitting position for braking. It is a quick descent method but does require quite a bit of physical exertion for braking, and ice axes are necessary.

I guess I got a little ahead of myself with the ice axe and glissading down the mountain. One does have to get up the mountain. Actually, there is another important piece of equipment needed for moving on ice and snow—crampons. These are like little ice picks mounted on a metal frame and attached to your boots. They are made of hardened steel and usually consist of 10 vertical points for most work, but can have two additional front points on a slant for climbing vertical ice. Crampons give a good bite on ice and snow and give one a great feeling of security on surfaces that would otherwise be quite treacherous.

Some hints on clothing

It is difficult to arrange the points of discussion in a specific sequence of importance. Equipment is certainly very important, but so is **clothing**. I have encountered weather conditions in the Smokies probably as severe as the conditions we experienced on Mt. Rainier in Washington or Mt. Orizaba at its 18,851-foot elevation. Cotton and down lose their insulating ability when wet and are of little value where damp weather is involved (like in the Smokies). Wool retains its dead-air structure when wet and consequently makes an excellent

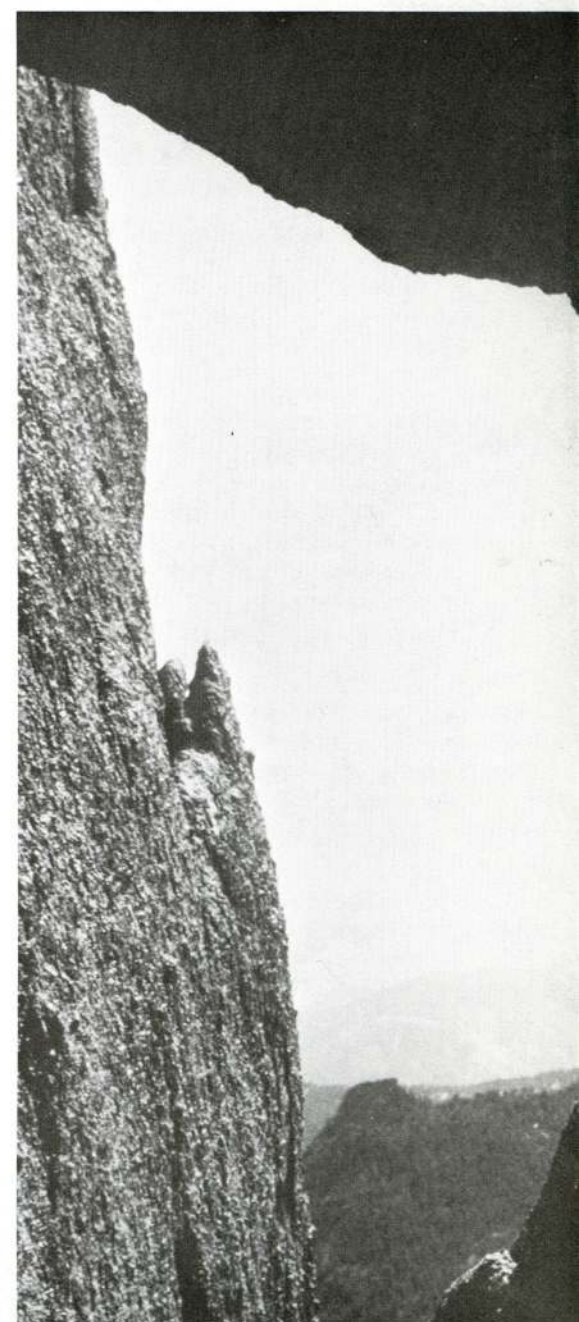
insulator. Multi layers are better than one massive thickness.

Temperatures cover a wide range in hiking and climbing, and it is better to be able to take off or add pieces to adjust for these changes. A windproof shell and a waterproof cover are important items. Headwear is also necessary, because approximately one-third of body heat loss occurs here. Gaiters are also required for snow travel. High-top boots do not permit the freedom of leg movement required for hiking, so most climbers use short boots and cover their lower legs with gaiters—protective coverings that overlap the boots and keep out snow and ice. A good cold-weather down parka is vital. Although it may not be needed regularly, it is wise to have one along.

Some risks are involved any time a person does something, and mountaineering is no exception. With good equipment, technique, physical conditioning and sound judgment, most obstacles can be overcome. Rockfalls, storms and avalanches are difficult to predict and to cope with, but more accidents occur because of human mistakes than because of natural catastrophes. Due to lower air density at high altitudes, the sun's ultraviolet radiation is much more intense, and severe sunburn and snow blindness are real problems. Ice and snow totally cover the ground too, so this added reflection only worsens matters. Actual cases have been reported of severe sunburn in the roof of the mouth and within the nostrils. On the other end of the temperature scale, one has to guard against frostbite, hypothermia and exhaustion caused by overexertion and low temperatures. First-aid supplies are mandatory, and several climbers must have first-aid training.

High-altitude problems

Before leaving the problem area, we should discuss the subject of the physical and mental effects of high altitudes. These are some of the most frustrating problems a climber faces and also some of the most mystifying to medical science. The various problems associated with high-altitude climbing can vary with individuals, but generally, one encounters a loss of appetite,



difficulty in sleeping and general feeling of exhaustion. The thinking process is markedly affected, and it is not uncommon to suffer a 50 percent deficiency at elevations above 18,000 feet. Our bodies do a remarkable job in trying to adapt to the harsh high-altitude conditions but meet with only partial success. Unfortunately, man cannot stay at these heights very long on his own.

One can experience dizziness, headaches, shortness of breath, vomiting, hallucinations, loss of mental capacity, lack of motivation and retinal hemorrhaging. There are three general classifications of mountain sickness: acute mountain sickness, high-altitude pulmonary edema and cerebral edema. The latter two types, involving excessive body fluids in the lungs and brain, are very serious and can be fatal unless the person is taken to a lower elevation and treated quickly. Mountain sickness follows no logical pattern for selecting its victims—well-conditioned climbers have been affected while less-conditioned climbers have escaped. It also does not seem to respect age or sex. The effects are directly related to the low density of oxygen. It has been determined that slow ascents of about 1,000 feet per day will help relieve the symptoms.

When serious cases of mountain sickness occur, the climbers must get down as quickly as possible and obtain medical treatment.

Well, folks, I guess that's about it. I haven't told you about the danger of the "Abominable Snowman," the

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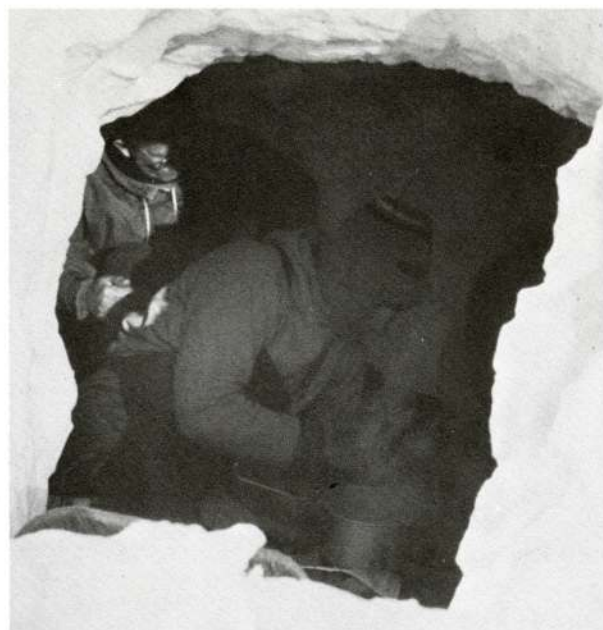


of "Montezuma's Disease" or
ill effects of eating "yellow
." I did try to touch on a few of
aspects of climbing in a very
al manner. So, for you do-it-
selfers who might jump out the
ow to go and climb Mt. Everest—
for me.

cerely, though, if you are
ested, contact people who climb;

talk with them; go out with
experienced people. Read all you can
and buy equipment slowly and
wisely. Don't outfit your expedition
from Abercrombie and Fitch all at
once. Move slowly, soundly and
safely.

Enjoy the mountains.



Clockwise from left:

Author Randolph gazes at mountains on 'Twin Oaks' in
Rocky Mountain National Park.

Ice cave - home for the night

Grand Tetons, Wyoming

Herb and Marion on Mt. Rainier

Ice break-up on Ingraham Glacier, Mt. Rainier



Bowling tournament champs



All Events - 1909 Hc.
Pat Hunsicker



Mixed Doubles - 1144 Sc.
Pat Hunsicker, Bill Maddux



Women's Singles - 690 Hc.
Marie Hickson

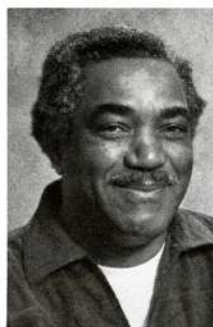
Men's Singles - 649 Sc.
Bill Davy



Men's All Events - 1758 Sc.
James McNabb



Men's All Events - 1984 Hc.
Roy Nabors



Men's Doubles - 1332 Hc.
William Anthony, Frank Larimer



Men's Singles - 685 Hc.
Robert DeBakker



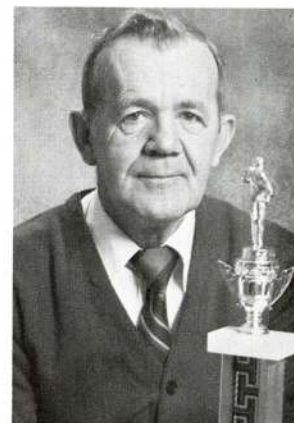
All Events - 1697 Sc.
Ruby O'Kain



Women's Singles - 615 Sc.
Louise Warmely



Men's Doubles - 1181 Sc.
Bill Ladd, Jim Fletcher



Mixed Doubles - 1325 Sc.
Eunice and Marvin Wilkerson

Save Energy. . .Share The Ride

ORNL

CAR POOL MEMBER from Walker Springs/Cedar Bluff area, West Knoxville, to East Portal, 8:15-4:45. K. M. Weeks, plant phone 4-5462, home phone 691-4552.

JOIN or FORM CAR POOL from Woodland area, Oak Ridge, to 7500 area, flexible days. Fred Baes, plant phone 6-2137, home phone 483-5118.

RIDE from Fox Den condominiums, West Knoxville, to East Portal, 8:15-4:45. Sue Alley, plant phone 4-4893, home phone 966-3115.

RIDERS or CAR POOL MEMBERS from Walker Springs/Cedar Bluff area, West Knoxville, to any portal, 8-4:30. Roy Lee, home phone 693-3730.

CAR POOL MEMBER from Cedar Bluff area of Middlebrook Pike or Walker Springs Road, Knoxville, to East Portal, 8:15-4:45. E. L. Fair, plant phone 4-5723, home phone 693-3211.

JOIN CAR POOL from Kingsgate Subdivision, Concord, to East or South Portal, 8-4:30. Norman Teasley, plant phone 6-7558, home phone 966-9652.

ONE or TWO CAR POOL MEMBERS from Pennsylvania, West Outer, Highland, or Hillside areas, Oak Ridge, to East Portal, 8:15-4:45

shift. T. J. Burnett, plant phone 4-6683.

Y-12 PLANT

VAN POOL RIDERS from Fountain City, Norwood, Powell Shopping Center areas, to East and North Portal, straight day. Bill Moyer, plant phone 4-3195, home phone Knoxville 689-4087.

CAR POOL MEMBERS from Cedar Bluff, Kingston Pike area, to West Portal, 7:30-4 shift. Jack Hill, plant phone 4-2625, home phone Knoxville 693-6853.

VAN POOL service from Alcoa/Maryville to any portal, 8-4:30. Joel Horton, plant phone 4-3121, home phone Maryville 983-9160.

RIDE from Cherrybrook Subdivision, Clinton Highway, Knoxville, to East Portal, straight day. W. M. Elmore, plant phone 4-0532, home phone Knoxville 947-6725.

RIDE from West Knoxville area, Linda Heights, Kingston Pike, to Central Portal, straight day. Frances Walton, plant phone 4-7272, home phone Knoxville 966-1718.

RIDE from Clinton to North Portal, H Shift. Tim Hill, plant phone 4-3411, home phone Clinton 457-2098.

CAR POOL MEMBER from Cedar Bluff exit, I-40, Knoxville, to any



Women's Doubles - 1097 Sc.
Mellie Koons - Edith Baxter



Women's Doubles - 1306 Hc.
Patrice Bullen, Stephanie Livesey



portal, straight day. Ginny, plant phone 4-3320, home phone Knoxville 693-4755.

JOIN CAR OR VAN POOL from East Clinton to North Portal, or will take RIDERS, to North Portal, straight day. James Wilson, plant phone 4-1812, home phone Clinton 457-5629.

ORGDP

RIDERS from WNOX Radio Station or Krogers on Tazewell Pike, Knoxville, 7:45-4:15 shift, Portal 2. Janice, plant phone 4-7913.

ONE CAR POOL MEMBER from Harriman or Rockwood area, 7:45-4:15 shift, Portals 2 or 4. Donna, plant phone 4-7914, home phone Harriman 882-1028.

BUS POOL from Cumberland Estates (down Oak Ridge Highway) to Portals 1, 2, 3, 4 and 7, straight day. Gale Helton, plant phone 6-4601, home phone Knoxville 690-3949.

CAR POOL MEMBERS from Farmington subdivision (West Knoxville), 7:45-4:15 shift, Portals 1

and 2. Carol Sady, plant phone 4-8698, home phone Knoxville 690-2585.

BUS RIDERS from Oak Ridge (most residential areas on north side of Turnpike between New York and Montana), 7:45-4:15 shift. Dennis Hibben, plant phone 4-8300, home phone Oak Ridge 482-4139.

RIDE OR JOIN CAR POOL from Cedar Bluff area to East or Biology Portals, straight day. Mike Harrington, plant phone 4-0414, or 4-6329, home phone Knoxville 691-4742.

RIDE or CAR POOL from Rock Springs Road, Lenoir City, to East Portal, 8-4:30 or 8:15-8:45 shift. Ed Tinnel, plant phone 4-4637.



QA Message Contest winners announced



QA WINNERS—W. D. 'Bud' Brickeen, Engineering Division at Paducah; and Pat Holliday, Purchasing, took top prizes in the Quality Assurance message contest. Brickeen won overall laurels from the four plants; Holliday for the Paducah Plant. From left are Barry Chapman, Clayton Zerby, Plant manager; Brickeen, Holliday and Marve Lisso.

Winners of the recent Quality Assurance Message Contest, held as part of the Nuclear Division-wide observance of Quality Assurance Week, have been selected.

W. D. Brickeen, Paducah Plant Engineering, was the Nuclear Division overall winner with the slogan, "Quality Assurance Each Day Keeps The Failures Away."

ORGDP winners and their messages were: J. D. Stephens, Maintenance, "A Company Is Known By The Quality It Keeps"; and B. L. Lipps, Maintenance, "Quality Makes Cents."

Winners and messages from ORNL were: C. H. Shappert, Information,

"Quality Is Man's Yearning For Excellence"; and J. R. Weir, Jr., Metals and Ceramics, "The Worker To Be Prized Is Quality Wise."

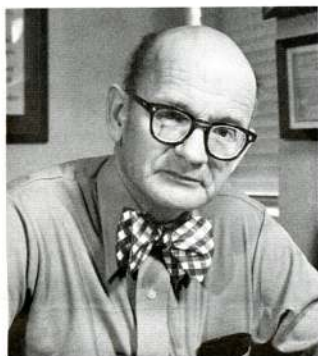
Brickeen and P. A. Holliday, Purchasing, were named Paducah winners. Holliday's message was "If Quality Is Good, You've Planned As You Should."

The two Y-12 winners and their messages were: R. V. Anderson, Maintenance, "Quality Is Not Accidental, It Happens On Purpose"; and J. R. Milligan, Fabrication, "Good Planning—Prime Quality—Reasonable Time—Lowest Cost = Quality Assurance."

Safety Scoreboard

Time worked without a lost-time accident through March 13:

| | | |
|------------------|----------|--------------------------|
| ORGDP | 38 Days | 1,315,747 Employee-Hours |
| ORNL | 136 Days | 4,444,726 Employee-Hours |
| Paducah | 295 Days | 3,183,000 Employee-Hours |
| Y-12 Plant | 100 Days | 3,377,000 Employee-Hours |



A report on cytogenetics

by T. A. Lincoln, M.D.

(Editor's Note: Dr. Lincoln alternates his regular column with "The Medicine Chest," where he answers questions from employees concerning health in general. Questions are handled in strict confidence, as they are handled in our Question Box. Just address your question to "Medicine Chest," NUCLEAR DIVISION NEWS, Building 9704-2, Stop 21, Y-12, or call the news editor in your plant, and give him or her your question on the telephone.)

In a recent *New York Times* article, enthusiasm was expressed about cytogenetics as a method for detecting the harmful effects of toxic materials. In general, the article was fairly critical of industry's present use of or failure to use this testing technique. Because reports on cytogenetic testing results are undoubtedly going to appear more frequently in the news media, the general public needs to understand this technique.

Cytogenetics is a field of science that focuses on the number and structure of chromosomes. Chromosomes are composed of protein and a highly specialized chemical substance called deoxyribonucleic acid (DNA). Special arrangements of DNA make up the thousands of genes that carry the hereditary information. Each of the reproductive cells—the sperm and the egg—contains only half the needed chromosomes, or 23. This limitation means that, when fertilization occurs, one-half of the inherited material comes from each parent.

Many of the cells in the body live for a relatively short time and are replaced by new cells. For example, the cells that line the small intestine

are renewed every 48 hours. Most other cells are replaced much more slowly. Regardless of speed, this continual replacement process could lead to less healthy new generations of cells, if the genetic material were permanently damaged. One concern is that damage to the genetic material could make a person more vulnerable to degenerative or malignant disease later in life.

Before 1956, man was thought to have 48 chromosomes. Geneticists J.H. Tjio and A. Levan used new culture techniques to stain, study and count them and found that there were only 46. Their techniques heralded an almost explosive expansion in chromosome study. Blood cells can now be cultured, and gross damage as well as extremely subtle damage to genetic material can be detected.

Except during the dividing process, chromosomes appear only as formless granularity in the cell nucleus. Only one type of blood cell, the small lymphocyte, can be made to divide. This cell is involved in the immune response and can therefore be stimulated to divide by adding phytohaemagglutinin, a substance called a mitogen, which stimulates the immune reaction.

To perform this test, 5 to 10 milliliters of blood are withdrawn from a vein in the arm and put into a tube containing an anticoagulant to prevent the blood from clotting. A portion of the blood is added to the phytohaemagglutinin culture medium and incubated for 45 to 50 hours.

During this incubation period, the DNA doubles in amount in preparation for cell division. This dividing process is known as mitosis and has probably been studied by most high school biology students.

The chromosomes line up and divide into parallel strands called chromatids. It is in this phase, called metaphase, that chromosomes are most clearly visualized. The dividing process is then stopped suddenly by the addition of special chemicals called spindle inhibitors. These inhibitors stop mitosis completely without damaging the fine chromosome structure. The cells are then separated, fixed with preservatives, spread on a slide, stained and studied under the microscope.

Many types of gross abnormalities can readily be seen, classified and counted. To perform such classification and counting requires an expert with much training and experience. Chromosomes may be damaged in many ways. They may show breaks, or these breaks may join together to form abnormal structures such as rings or dicentric. Many other types of damage can sometimes be seen.

More recently, new techniques have been developed to greatly increase cytogenetic sensitivity. Many genetic laboratories now stain chromosomes with certain compounds that reveal light or dark shaded bands on each chromosome. It is now possible to see as many as 1500 bands and a large number of sub-bands on all the chromosomes.

Another specialized technique for chromosome study involves adding special chemicals during the incubation process to cause fluorescence on the chromatid strands. Through this technique, strand portions can be shown to have been exchanged sometime before metaphase. This process is called sister chromatid exchange. The individual chromosomes are perfectly normal, but, for some unknown reason, a portion of the DNA was exchanged with a "sister" portion on the other chromatid.

Studies of chemical and radiation effects on chromosomes can be done either by exposing the lymphocytes after removal from the body (in vitro testing) or by examining cells that have been exposed while in the body (in vivo testing). Checking the gross chromosome damage is a sensitive method of estimating accidental exposure to ionizing radiation. Recently, many chemicals have been shown to cause sister chromatid exchange. However, sister chromatid exchange is still a new technique and is difficult to interpret. The mechanism and significance of the exchange are not yet fully understood.

It will only be after several years and many studies when the natural background of chromosome damage will be fully appreciated. For example, what role does exposure to medicines, tobacco, alcohol or viral infections play? Exposing cells outside the body has already been established as a valuable, but still somewhat controversial, technique.

When one considers that approximately 100,000 genes are distributed among the 46 chromosomes, the complexity of the inheritance process can be appreciated. The probability of healing minor damage also has to be considered. Nevertheless, cytogenetic testing may someday become a basic method for evaluating exposure to environmental toxicants.

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Y-12 PLANT

35 YEARS

Lloyd T. Murphy, Dimensional Inspection; and Buford E. Reneau, Material Transfer and Packing.

30 YEARS

Earl E. Goode Jr., Materials and Services Administration; and William J. Hayes, Tool Grinding.

25 YEARS

Erb H. Mowery, Glenn F. Babb, William E. Underwood and Luther C. Maples.

ORNL

35 YEARS

James R. Foster, Operations.

30 YEARS

Albert G. Grindell, Engineering Technology; John P. Miser, Plant and Equipment; Baird F. Bottenfield, Engineering; Robert L. Moore, Instrumentation and Controls; and Edward W. Chandler, Plant and Equipment.

25 YEARS

Neva P. Hair, William F. Bunch and Raymond R. Dickison.

20 YEARS

John L. Moore, Lester D. Hulett Jr., James G. Carter, Kenneth V. Cook, Roberta P. Duncan and Richard E. Wintenberg.

PADUCAH

25 YEARS

Mary E. Pfost and O. Harry Goforth.

ORGDP

35 YEARS

David J. Johnson Jr., Engineering; Robert L. Payne, Shift Operations; Eugene J. Barber, Enrichment Technology; John A. May Jr., Operations; William J. Weeks, Maintenance; Clarence V. Black, Separation Systems; Albert F. Griffin, Maintenance; William Vest Jr., Maintenance; Jack McKinney, Operations; and George W. Floyd, Enrichment Technology.

30 YEARS

Frank S. Jones, Separation Systems.

25 YEARS

James H. Freels and Janette N. Gray.

20 YEARS

William D. Goode Jr., Betty E. Attkisson and Jack T. Hartman.



FILL'ER UP—Gasohol program coordinator Bill Halicks fills up his tank with the assistance of Joseph Holder, station attendant. The plant recently marked a month of successfully fueling the entire fleet of automobiles and equipment at the plant with a 10 percent alcohol - 90 percent gasoline blend of fuel.

James J. Finley, Y-12 employee, dies



Mr. Finley

James J. Finley, Alpha 5 Processing in Y-12, died February 29 in Cumberland County. A native of Cartersville, Ill., he had been with Union Carbide since 1947, working first at ORGDP in the Metals Division and the Carbon Products Division. He came to Y-12 in 1968.

Mr. Finley was a graduate of the University of Southern Illinois and attended the University of Buffalo and the University of Tennessee. He was a veteran of the U. S. Air Force.

Survivors include his wife, Beulah Shepherd Finley, Route 5, Dunbar Road, Crossville; daughters, Patricia and Pamela; sons, Mike and Robert; sister, Elizabeth Scroggin; and brothers Ted, Joseph and Robert Finley.

Funeral services were held in Burris Funeral Chapel, with burial in Big Lick Cemetery.

Gasohol

(Continued from page 1)

sample showed an exact 10 percent mixture of alcohol and gasoline.

The Paducah Plant is not included in the UT study or covered by the U&E Committee, both of which are designed for the Oak Ridge area. PGDP is, however, involved in its own gasoline conservation program. One aspect of this—the use of gasohol in the PGDP automotive fleet—is described on page of this issue.

Transportation

(Continued from page 1)

in-plant bus service has been intensified, with the addition of more bus runs and demand response taxi service in many cases.

"Fine tuning" adjustments will continue to be made to the interim system as feedback is received from employees.

There is very little conclusive data on the use of gasohol and its long-term effects, Halicks said. He hopes that as the plant's experience with the fuel progresses, more specific information can be documented.

In addition to the gasohol program, PGDP also employs gas rationing through the distribution of coupons and restricted fuel pump hours.

Do you have a complaint, compliment or suggestion about our transportation system that you'd like to channel to the right person? Contact your User and Evaluation Committee representative, listed in this article.

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